WHAT IS CLAIMED IS:

1. A human power amplifier assist device, including:

a lift pulley with a cable wound thereon;

an actuator arranged to turn the lift pulley so as to wind and unwind the cable;

an end-effector connected to the cable and connectable to a load, the end-effector including a sensor for detecting an operator-applied force on the end effector;

a controller for controlling operation of the actuator, the controller being responsive to a first signal from the sensor representing operator-applied force and at least one additional signal representing the condition of the cable; and

the controller being programmed to cause the actuator to wind and unwind the cable in response to the first signal, and to override the control as a function of the first signal in response to the additional signal.

2. The device of claim 1, further including:

a cable slack sensor; and

a cable end sensor;

wherein the at least one additional signal representing the condition of the cable includes a cable slack signal generated by the cable slack sensor and a cable end signal generated by the cable end sensor.

3. The device of claim 2, wherein said cable slack sensor includes:

a guide pulley, located between the lift pulley and the end-effector, and over which the cable passes;

a biasing means for biasing the guide pulley against a cable normal force caused by a cable passing thereover, said biasing means operating to absorb at least a portion of any slack in the cable; and

a cable slack switch, for detecting when the pulley has moved away from a normal operating position in response to the biasing means.

4. The device of claim 2, wherein the lift pulley includes a continuous groove about at least a portion of the periphery thereof and where said cable end sensor includes:

a guide pulley, located between the lift pulley and the end-effector, and over which the cable passes;

a lift pulley groove follower, said follower moving in a direction parallel to the lift pulley axis in response to rotation of the lift pulley; and

a cable end switch, for detecting when the pulley has unwound a predefined length of cable therefrom.

5. The device of claim 3, wherein the lift pulley includes a continuous groove about at least a portion of the periphery thereof and where said cable end sensor includes:

a guide pulley, located between the lift pulley and the end-effector, and over which the cable passes;

a lift pulley groove follower, said follower moving in a direction parallel to the lift pulley axis in response to rotation of the lift pulley; and

a cable end switch, for detecting when the pulley has unwound a predefined length of cable therefrom.

6. The device of claim 1, further including a cable slack sensor, wherein the at least one additional signal representing the condition of the cable includes a cable slack signal generated by the cable slack sensor.

7. The device of claim 6, wherein said cable slack sensor includes:

a guide pulley, located between the lift pulley and the end-effector, and over which the cable passes;

a biasing means for biasing the guide pulley against a cable normal force caused by a cable passing thereover, said biasing means operating to absorb at least a portion of any slack in the cable; and

a cable slack switch, for detecting when the pulley has moved away from a normal operating position in response to the biasing means.

8. The device of claim 1, further including a cable end sensor, wherein the at least one additional signal representing the condition of the cable includes a cable end signal generated by the cable end sensor.

9. The device of claim 8, wherein the lift pulley includes a continuous groove about at least a portion of the periphery thereof and where said cable end sensor includes:

a guide pulley, located between the lift pulley and the end-effector, and over which the cable passes;

a lift pulley groove follower, said follower moving in a direction parallel to the lift pulley axis in response to rotation of the lift pulley so as to move the guide pulley in association with the cable being unwound from the pulley; and

a cable end switch, for detecting when the pulley has unwound a predefined length of cable therefrom.

10. The device of claim 1, further including:

a handle on said end-effector, wherein said handle moves in response to force exerted thereon by a user, and where movement of the handle causes the generation of the first signal.

11. A device for monitoring the condition of a cable wound on a lift pulley, and generating at least one signal indicative of the condition, including:

a cable slack sensor; and

a cable end sensor;

wherein the at least one signal representing the condition of the cable includes a cable slack signal generated by the cable slack sensor and a cable end signal generated by the cable end sensor.

12. The device of claim 11, wherein said cable slack sensor includes:

a guide pulley, located between the lift pulley and an end-effector, and over which the cable passes;

a biasing means for biasing the guide pulley against a cable normal force caused by the cable passing thereover, said biasing means operating to absorb at least a portion of any slack in the cable; and

a cable slack switch, for detecting when the pulley has moved away from a normal operating position in response to the biasing means.

13. The device of claim 11, wherein the lift pulley includes a continuous groove about at least a portion of the periphery thereof and where said cable end sensor includes:

a guide pulley, located between the lift pulley and the end-effector, and over which the cable passes;

a lift pulley groove follower, said follower moving in a direction parallel to the lift pulley axis in response to rotation of the lift pulley; and

a cable end switch, operatively contacting the groove follower, for detecting when the pulley has unwound a predefined length of cable therefrom.

14. A method for monitoring the condition of a cable wound on a lift pulley, including:

monitoring the slack condition of a cable with a slack sensor; and

monitoring the length of cable, with a cable end sensor, to determine when a predetermined maximum length of cable has been unwound.

15. The method of claim 14, further including the step of generating at least one signal representing the condition of the cable, wherein the at least one signal includes a cable slack signal generated by the cable slack sensor and a cable end signal generated by the cable end sensor.

16. The method of claim 14, further comprising the steps of:

biasing a guide pulley, positioned along a path of the cable, against a normal force of the cable caused when the cable is taught, said biasing being of a sufficient magnitude so as to absorb at least a portion of the cable slack when the cable is not taught; and

detecting, using a cable slack switch, when the guide pulley has been moved from a normal operating position.

17. The method of claim 14, further comprising the steps of:

tracking the length of cable unwound from the guide pulley using a groove follower displaced as a function of the rotation of the lift pulley; and

detecting, using a cable end switch, when the groove follower has reached a predetermined position indicative of the maximum length of cable to be unwound.